

#### REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-35 and 37-40 are pending in the application, with claims 1, 11, 13, 22, 32, and 34 being independent. Claim 36 is canceled herein without prejudice to or disclaimer of the subject matter recited therein. Claims 1-3, 5, 8, 11, 13-15, 17, and 22-34 are amended herein. Support for the claim amendments and additions can be found in the original disclosure. No new matter has been added.

#### ALLOWABLE SUBJECT MATTER

The Office indicated that claims 11 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Office for the indication of allowable subject matter. Applicant has rewritten claims 11 and 32 to include the limitations of the base claim and any intervening claims. Accordingly, Applicant believes claims 11 and 32, which are now independent claims, are allowable.

#### DRAWING OBJECTION

The drawings stand objected to for failing to show every feature of the invention specified in the claims, particularly with respect to claim 1. Applicant respectfully traverses this objection. The amendments to claim 1 that were submitted in the response

to office action filed on 3/19/2008 included a recitation of a “bid term” and minor amendments intended to clarify the intended subject matter. (See Response to Office Action filed 3/19/2008). Fig. 2, items 212 and 208 relate to the bid term. For example, the specification states, “the STS module 212 is described as performing multiple functions such as historical query term mining, Web page retrieval, feature extraction, feature space dimension reduction and normalization, reinforced clustering of multi-type data objects, matching user bid term(s) to contents of reinforced clusters to perform search term suggestion, and term classification.” (Specification, page 11, paragraph [0031], lines 4-9). In addition, the specification includes a section titled “Exemplary Processing of a Bid Term” which discusses a term 208 (e.g., a bid term) which is illustrated in Fig. 2. (See Specification, page 24, paragraph [0064]-[0067]. Therefore, Applicant respectfully submits that at least Fig. 2 supports the amendments submitted in the Response to Office Action filed on 3/19/2008, and in particular, the “bid term.” Accordingly, Applicant requests withdrawal of the drawing objection.

#### CLAIM OBJECTIONS

Claim 17 stands objected to because on an inconsistency in language. Claim 22 stands objected to because “tangible” is not supported in the specification, but the Office suggests “computer-readable storage medium”. The Office is thanked for the suggestion. Claim 36 is objected to as being an improper dependent claim. Claim 36 is canceled herein. Claims 17 and 22-33, where claims 23-33 depend from claim 22, are amended

herein to address the informalities noted in the Office Action. Accordingly, Applicant requests reconsideration and withdrawal of the claim objections.

#### **§ 101 REJECTIONS**

Claims 34-40 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Office states, “the instant claims are directed to software *per se*” and “the instant claims are not limited to statutory subject matter and are therefore non-statutory. (Final Office Action, page 4, lines 1-5). Applicant respectfully traverses the rejection. As amended, claim 34 now recites: “A system *implemented in hardware*, the system comprising.” Applicant respectfully submits that claim 34, along with dependent claims 35-40, are now limited to statutory subject matter (i.e., hardware). Accordingly, Applicant requests reconsideration and withdrawal of the rejection.

#### **§ 103 REJECTIONS**

Claims 1-10, 12-31, and 33-40 stand rejected under 35 U.S.C. § 103(a) as being obvious over Singh et al., U.S. Patent Publication No. 2002/0165849 (hereinafter “Singh”) in view of Schuetze et al., U.S. Patent Publication No. 2003/0110181 (hereinafter “Schuetze”). Applicant respectfully traverses the rejection.

#### **Claims 1-10, and 12**

**Independent claim 1**, as presently presented, recites:

1. A computer-implemented method comprising:
  - determining a bid term, the bid term associated with multi-type data objects;
  - identifying intra-layer relationships among homogeneous objects of the multi-type data objects, wherein the intra-layer relationships are based on an interconnection between the multi-type objects of the same type based on attributes directly associated with the multi-type data objects;
  - identifying inter-layer relationships among heterogeneous objects of the multi-type data objects, wherein the inter-layer relationships are based on an interconnection between the multi-type objects of different types rather than attributes directly associated with the multi-type data objects;
  - iteratively, by a reinforced clustering algorithm, clustering the multi-type data objects by the intra-layer relationships and the inter-layer relationships to generate reinforced clusters; and
  - utilizing, by a search term suggestion module, the reinforced clusters to respond to the bid term from a user with search terms relevant to the bid term.

Applicant respectfully submits that Singh and Schuetze (hereinafter “cited references”), whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to teach or suggest each and every feature of claim 1.

First, Applicant submits that the cited references fail to teach or suggest “identifying inter-layer relationships among heterogeneous objects of the multi-type data objects, wherein the inter-layer relationships are based on an interconnection between the multi-type objects of different types rather than attributes directly associated with the multi-type data objects,” as recited in claim 1. The above recitation, in part, was formerly recited in claim 2, which recited “inter-layer relationships.” In the rejection of claim 2, the Office relied upon Schuetze as teaching “inter-layer relationships,” by citing paragraph [0032] of Schuetze. In particular, the Office relies on the language of Schuetze including “The method takes advantage of multiple ways in which a user can specify items

of interest. For example, in images, features from the text and image modalities can be used to describe the images... clustering may be performed on a different feature (e.g., surrounding text, image URL, image color histogram, genre of the surrounding text).” (Final Office Action, page 6, paragraph 2, lines 4-7).

Applicant submits that the relied upon portion of Schuetze fails to teach or suggest “inter-layer relationships” as currently recited in claim 1 because Schuetze only teaches attributes of objects, such as an image, which may include “surrounding text, image URL, image color histogram, genre of the surrounding text,” (See Schuetze, paragraph [0032]). Thus, Applicant submits that these examples *are limited* to attributes of the image (i.e., object), and are not “inter-layer relationships,” as recited in claim 1. As further recited in claim 1, the “inter-layer relationships” are “based on an interconnection between the multi-type objects of different types *rather than attributes directly associated with the multi-type data objects.*” (Claim 1, emphasis added). In Schuetze, attributes of an image are not *different types*, but they are directly associated with images. Therefore, the relied upon portion of Schuetze fails to teach or suggest each and every recitation of claim 1.

Second, Applicant submits that the cited references fail to teach or suggest “iteratively, by a reinforced clustering algorithm, clustering the multi-type data objects by the intra-layer relationships and the inter-layer relationships to generate reinforced clusters,” as recited in claim 1. The Office relies on Schuetze at paragraph [0035] and [0043], which are addressed in more detail as follows. (See Final Office Action, page 6, lines 6-12). Paragraph [0035] teaches “a user progressively narrows a collection to a

small number of elements of interest, similar to the Scatter/Gather system developed for text browsing, except [it] is extended hereby to use multi-modal features.” Applicant’s claim 1 recites “by a reinforced clustering algorithm.” Thus, the computer-implemented method recited in claim 1 performs operations without does not relying on user input to scatter elements, as taught by Schuetze, because claim 1 uses the reinforced clustering algorithm. In addition, because Schuetze fails to teach or suggest inter-layer relationships, as discussed above, then Schuetze cannot teach or suggest “clustering the multi-type data objects by the intra-layer relationships and the inter-layer relationships to generate reinforced clusters.” Paragraph [0043] of Schuetze teaches “iterative clustering and selection of cluster subsets can help a user identify images of interest,” again teaching user intervention in the process which is distinguishable from an iterative clustering using “a reinforced clustering algorithm” as recited in claim 1.

Due to the Applicant’s earnest belief that the claim 1 recites elements which are not taught or suggested in the cited references, Applicant will not specifically address motivation to combine with respect to claim 1, or any claims that depend from claim 1, during this response. Applicant hereby reserves the right to further challenge motivation to combine the cited references as applied to any of the pending claims.

**Dependent claims 2-10 and 12** depend from independent claim 1 and are allowable by virtue of this dependency, as well as for additional features that they recite. Although Applicant only addresses specific dependent claims, Applicant respectfully requests individual consideration of each dependent claim.

Claim 5, as presently presented, recites:

5. The method of claim 1, wherein the inter-layer relationships include a *first weighting scheme* and the intra-layer relationships include a *second weighting scheme different than the first weighting scheme* to indicate importance to associated objects of the multi-type data objects.

Applicant respectfully submits that the cited references fail to teach or suggest each feature of claim 5. The Office relies on Schuetze at paragraph [0033] as teaching “various document features in different modalities are appropriately weighted and combined to form clusters representative of overall similarity.” (Final Office Action, page 7, paragraph 5, line 3 to page 8, line 1). Here, Schuetze is weighing “features,” rather than relationships between objects, being one of inter-layer relationships or intra-layer relationships, as recited in claim 5. Accordingly, Applicant submits that the relied upon portion of Schuetze fails to teach or suggest “the inter-layer relationships include a first weighting scheme and the intra-layer relationships include a second weighting scheme different than the first weighting scheme to indicate importance to associated objects of the multi-type data objects.”

Claim 7, as presently presented, recites:

7. The method of claim 1, wherein the iteratively clustering comprises *propagating clustering results of a first iteration to all related data objects of the multi-type data objects*, at least two of the related data objects being of heterogeneous data type, the propagating being used to enhance clustering of respective ones of the multi-type data objects in a second iteration of reinforced clustering operations.

Applicant respectfully submits that the cited references fail to teach or suggest each feature of claim 7. More specifically, Applicant submits that Schuetze fails to teach

or suggest “propagating clustering result” as recited in claim 7. The Office relies on Schuetze at paragraph [0152] which is presented below for convenience.

[0152] As stated above, the approach set forth herein is similar in some ways to the Scatter/Gather methods set forth in the Cutting et al. article as well as U.S. Pat. No. 5,442,778, the disclosure of which is hereby incorporated by reference as though set forth in full herein. Scatter/Gather was originally designed for use with text features derived from documents. Scatter/Gather iteratively refines a search by “scattering” a collection into a small number of clusters, and then a user “gathers” clusters of interest for scattering again. The Scatter/Gather method is extended by the invention to extend to a multi-modal, multi-feature method, using both text and image features to navigate a collection of documents with text and images; there is also an “expand” (i.e., mapping) function so that elements from outside the working set can be incorporated into the working set.

(Emphasis added). As described in paragraph [0152], Schuetze teaches a user based process of reclustering documents. However, this relied upon section fails to teach or suggest “propagating clustering results of a first iteration to all related data objects of the multi-type data objects.” In fact, the “propagating” to “all related data objects” creates additional relationships, which ultimately enable “the reinforced clusters to respond to the bid term from a user with search terms relevant to the bid term,” as recited in the independent claim 1, from which claim 7 depends. Accordingly, Applicant believes claim 7 is patentable over the cited references.

Claim 12 recites:

12. The method of claim 1, wherein the utilizing the reinforced clusters comprises:

- responsive to receiving the bid term from a user, comparing the bid term with a *feature space of objects in the reinforced clusters*;
- responsive to comparing, identifying one or more search term suggestions; and
- communicating the search term suggestions to the user.



Applicant respectfully submits that the cited references fail to teach or suggest each feature of claim 12. More specifically, Applicant submits that Schuetze fails to teach or suggest “comparing the bid term *with a feature space of objects in the reinforced clusters*” as recited in claim 12. The Office relies on Singh at paragraph [245] which teaches “Preferably, the additional search terms are generated using methods such as a string matching algorithm applied to a database of bidded search terms and/or a thesaurus database implemented in software.” (Final Office Action, page 10, paragraph 12, lines 3-5). Applicant respectfully submits that “a database of bidded search terms and/or a thesaurus database implemented in software” do not teach or even suggest “A feature space of objects in the reinforced cluster,” as recited in claim because “a database of bidded search terms and/or a thesaurus database implemented in software” is not a reinforced cluster, of which is required for the feature as “a feature space of objects in the *reinforced clusters*.”

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection to claims 1-10, and 12.

Claims 13-21

**Independent claim 1**, as presently presented, recites:

13. A computing device comprising:  
a processor; and  
a memory coupled to the processor, the memory comprising  
computer-program instructions executable by the processor for:

identifying relationships among multi-type data objects, wherein the identified relationships include intra-layer relationships and inter-layer relationships such that:

the intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects, and

the inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects;

iteratively clustering the multi-type data objects by at least one of the identified relationships to generate reinforced clusters, each relationship of the relationships being weighted to indicate an importance to associated objects of the multi-type data objects; and

utilizing, by a search term suggestion module, the reinforced clusters to respond to a bid term from a user with search terms relevant to the bid term.

Applicant respectfully submits that the cited references, whether taken alone or in combination (assuming for the sake of argument that they can be combined), fail to teach or suggest each and every feature of claim 13.

Applicant submits that the cited references fail to teach or suggest at least “identified relationships include intra-layer relationships and inter-layer relationships,” as recited in claim 13. The above recitation, in part, was previously recited in claim 14, which recited “inter-layer relationships.” In the rejection of claim 14, the Office relied upon Schuetze as teaching “inter-layer relationships,” by citing paragraph [0032] of Schuetze. In particular, the Office relies on the language of Schuetze including “The method takes advantage of multiple ways in which a user can specify items of interest. For example, in images, features from the text and image modalities can be used to

describe the images... clustering may be performed on a different feature (e.g., surrounding text, image URL, image color histogram, genre of the surrounding text).” (Final Office Action, page 13, paragraph 14, lines 8-11).

Applicant submits that the relied upon portion of Schuetze fails to teach or suggest “inter-layer relationships” as recited in claim 13 because Schuetze only teaches attributes of an objects, such as an image, which may include “surrounding text, image URL, image color histogram, genre of the surrounding text,” (See Schuetze, paragraph [0032]). Applicant submits that these examples are limited to attributes of the image (i.e., object), and thus are not “inter-layer relationships,” as recited in claim 1. As further recited in claim 13, the “inter-layer relationships are *among heterogeneous objects* of the multi-type data objects *having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects.*” (Claim 13, emphasis added). Because claim 13 recites inter-layer relationships as “*heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects,*” the relied upon portion of Schuetze fails to teach or suggest each and every recitation of claim 13.

**Dependent claims 14-21** depend from independent claim 13 and are allowable by virtue of this dependency, as well as for additional features that they recite. Applicant respectfully requests individual consideration of each dependent claim.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection to claims 13-21.

Claims 22-31, and 33

**Independent claim 22**, as presently presented, recites

intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects, and wherein the inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects.

Applicant respectfully submits that the cited references fail to teach or even suggest each and every feature as recited in claim 22, and in particular, the “intra-layer relationships” and “inter-layer relationships.” Applicant relies on at least similar reasoning as presented above in support of claims 1 and 13, as applied to claim 22. More specifically, Applicant submits that Schuetze does not teach “inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects” because Schuetze only teaches using attributes directly associated with documents as described in paragraph [0032] of Schuetze.

**Dependent claims 23-31 and 33** depend from independent claim 22 and are allowable by virtue of this dependency, as well as for additional features that they recite. Applicant respectfully requests individual consideration of each dependent claim.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection to claims 22-31 and 33.

Claims 34-35, and 37-40

the identified relationships including intra-layer relationships and inter-layer relationships, wherein the intra-layer relationships are among homogeneous objects of the multi-type data objects having an interconnection based on attributes directly associated with multi-type data objects, and wherein the inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects.

Applicant respectfully submits that the cited references fail to teach or even suggest each and every feature as recited in claim 34, and in particular, the “intra-layer relationships” and “inter-layer relationships.” Applicant relies on at least similar reasoning as presented above in support of claims 1 and 13, as applied to claim 34. More specifically, Applicant submits that Schuetze does not teach “inter-layer relationships are among heterogeneous objects of the multi-type data objects having an interconnection between heterogeneous objects of different types rather than attributes directly associated with the multi-type data objects” because Schuetze only teaches using attributes directly associated with documents as described in paragraph [0032] of Schuetze.

**Dependent claims 35 and 37-40** depend from independent claim 34 and are allowable by virtue of this dependency, as well as for additional features that they recite. Applicant respectfully requests individual consideration of each dependent claim.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection to claims 34-35 and 37-40.

CONCLUSION

For at least the foregoing reasons, claims 1-35 and 37-40 are in condition for allowance. Applicant respectfully requests reconsideration and withdrawal of the rejections and an early notice of allowance.

The arguments and amendments presented herein were necessitated by the most recent Office Action, and could not have been presented previously because the final Office Action rejected claims based on new art not previously of record.


If any issue remains unresolved that would prevent allowance of this case,  
Applicant requests that the Examiner contact the undersigned attorney to resolve the issue.

Respectfully Submitted,

Lee & Hayes, PLLC

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